



TV Tuners



Want to play, pause and record television shows on the PC? Add the right TV tuner and you get all the benefits of the box in a slick, flexible format you control. We test 12 tuners that will put you in the picture

As summer draws to a close and the weather turns grey, chances are you'll spend more time indoors watching TV. Television technology has really come on in recent years. Why watch flickering VHS tapes on an enormous black box in the corner when you can record all your favourite shows to hard disk and play them instantly on a sleek flat screen?

Electrical stores everywhere are cashing in on this new technology, selling flat-screen TVs, hard disk recorders and DVD recorders. But if you own a PC, you probably already have a liquid crystal display (LCD), a hard disk and a DVD writer. It makes sense to save yourself a few hundred pounds and use these instead. Then the only thing you need to buy is a TV tuner.

Adding a TV tuner to your PC costs as little as £30, and allows you to watch TV on an LCD, pause live TV and record shows to hard disk for later viewing. This month we've tested 12 such products, from simple analogue models to Freeview tuners with integrated electronic programme guides (EPGs) so you'll never have to miss your favourite shows again. We'll reveal which produce the best picture, which are easiest to use and which are the best value.



CHOOSING A... TV TUNER

The first consideration when choosing a TV tuner is whether you want to view analogue or digital Freeview TV shows. Analogue cards are cheaper, but analogue TV broadcasts include only five channels and no electronic programme guide. Freeview offers more channels and broadcasts TV listings. To find out whether you can receive Freeview broadcasts in your area, use the postcode checker at www.freeview.co.uk. If you expect your area to be upgraded from analogue to Freeview in the future,

you should consider one of the two hybrid tuners reviewed on page 191, which can receive both signals. Unlike some digital-only tuners, these hybrid tuners can also capture footage from analogue video devices.

NAME THAT TUNER

You also need to consider how you are going to add the tuner to your computer. Universal Serial Bus (USB) tuners, which are ideal for notebook PCs, connect to a single USB port. PCI tuner cards require a free PCI slot on the motherboard of a desktop computer, but they tend to be cheaper and the result is a neater system with the tuner hidden away. AVerMedia's DVB-T STB7 connects directly to your monitor. It can't record or time-shift TV programmes, but it's easy to install and move around the house, and even works with your PC switched off – or no PC at all.

Every TV tuner in this group has an RF socket, which means you can connect it to a rooftop aerial. If you want to record video from another source such as an analogue camcorder, many include an S-video or composite video input. Some tuners can also receive FM radio signals. The table on page 192 shows the inputs available on each card.

TIME OUT

Apart from the two analogue Hauppauge tuners, all the tuners in this test are capable of time-shifting. Time-shifting functions record TV shows as you watch them, allowing you to pause, rewind and, afterwards, fast-forward through the programme.

The Freeview tuners also include an EPG, which allows you to pick the programmes you want to watch or record from a list. Some Freeview tuners can download EPG listings for the week ahead from certain channels. Others show only the programmes currently on air and those that will follow. Our table shows which provide full weekly

listings. The best EPG interfaces are included with the TwinHan and Nebula TV cards.

Analogue TV channels don't broadcast EPG information, but there are alternative ways to organise your TV viewing. Several products in this group are compatible with the TVTV EPG found at www.tvtv.co.uk. This costs around £15 per year, and allows you to browse listings and set programmes to record with one click.

SOFT OPTIONS

When buying a TV tuner, another key consideration is the software included. Some tuners, such as Hauppauge's WinTV products, include software that is frustrating to use. Others, such as the Nebula DigiTV, include software that puts more expensive products such as Microsoft's Windows XP Media Center Edition to shame. TwinHan and Pinnacle also include impressive software.

IN THIS REVIEW

ANALOGUE TV TUNERS

Hauppauge WinTV-Express

Hauppauge WinTV-USB2

Leadtek WinFast TV 2000 XP

Pinnacle PCTV 100e

Pinnacle PCTV 110i

DIGITAL TV TUNERS

AVerMedia DVB-T STB7

AVerMedia AVerTV DVB-T USB2

Hauppauge WinTV-NOVA-T PCI

Nebula Electronics DigiTV PCI

Pinnacle PCTV 200e

ANALOGUE/DIGITAL TV TUNERS

AVerMedia AVerTV Hybrid+FM PCI

TwinHan Ter D+A



REVIEW ANALOGUE TV TUNER

HAUPPAUGE
WinTV-Express

RATING ★★

PRICE £24 inc VAT

SUPPLIER www.savastore.comDETAILS www.hauppauge.co.uk

The WinTV-Express box contains only a small PCI card, quick start instructions and an installation disc. There's no remote control, so it can only be controlled using a mouse or keyboard. Installation is straightforward but time consuming, as you need to install numerous different drivers and several applications. The software scans for channels automatically. It found all five terrestrial channels, but we had to name and reorder them manually. The card has no hardware MPEG2 encoder, so you can't pause live TV shows. You can still record TV programmes, though. Recorded shows are saved as DivX or MPEG2 files.

Hauppauge's WinTV 2000 software is starting to show its age. The interface looks unattractive and its control layout is confused and awkward. It takes some perseverance to find all the functions. The picture quality produced was disappointing, with ghosting and bands of noise across the picture. The picture from a DVD player connected through the composite video input was better, if a little soft.

The WinTV-Express is extremely cheap. If all you want to do is watch the five analogue TV channels, it will do the job. However, it's not particularly easy to use. Most people will want a remote control and time-shifting functions. If you want a cheap analogue TV card, Leadtek's WinFast TV 2000 XP is a far better choice.



Cheapest in the group



No time-shift or remote control

SPECIFICATIONS PCI interface, RF, line in and composite inputs

REVIEW ANALOGUE TV TUNER

HAUPPAUGE
WinTV-USB2

RATING ★

PRICE £53 inc VAT

SUPPLIER www.dabs.comDETAILS www.hauppauge.co.uk

Hauppauge's USB TV tuner isn't much to look at. It feels solid enough, but the silver finish look cheap. The inputs and outputs are poorly located, with the RF input and USB lead on opposing ends, so the box is positioned awkwardly between two cables. It has an S-video input, so you can copy video from an analogue camcorder, and a composite video converter is included.

The WinTV-USB2 has a responsive remote control, but its infrared receiver is placed next to the USB lead and can easily be blocked. The remote itself has separate buttons for Teletext and a number pad for selecting channels quickly.

Setting up the WinTV-USB2 is simple enough, but like the WinTV-Express it involves installing several programs. The viewing software works but is ugly and unintuitive. It has no (EPG). To schedule a recording, you need to run a separate application. It is possible to use better third-party software, though. We installed the latest version of ShowShifter, which we found considerably more user-friendly.

TV picture quality was disappointing, with significant onscreen ghosting. Using a DVD player connected via S-video produced an excellent picture.

Given its poorly designed hardware and dated software, the WinTV-USB2 is hard to recommend. Furthermore, it is fairly expensive. If you want an analogue tuner that connects via USB, the Pinnacle 100e is a better choice.



USB connection



Expensive; no time-shifting

SPECIFICATIONS USB interface, RF, line in, S-video and composite inputs

REVIEW ANALOGUE TV TUNER

LEADTEK
WinFast TV 2000 XP

RATING ★★★★★

PRICE £29 inc VAT

SUPPLIER www.savastore.comDETAILS www.leadtek.co.uk

Leadtek's WinFast TV 2000 XP tuner comes with a full English manual that has clear diagrams and explanations of the software's features. The card has numerous input and output connectors, including connectors for audio in and out and a socket for an FM radio aerial. The video input has a dongle that accepts both S-video and composite connectors. A decent bundle of Ulead software is included in the box, although installing it takes time. More annoyingly, the card doesn't locate the channels itself and has to be tuned manually. Initially we had trouble finding all the channels, but enabling the adaptive tuning option solved this.

The picture showed some slight ghosting, but its quality was acceptable and better than that of the Hauppauge tuners. The image from our DVD player was initially oversaturated, but adjusting the colour balance made it far better.

The remote control has a few too many fiddly buttons. The software reacts quickly to the remote in most circumstances, though enabling the time-shift mode is a bit sluggish. This is the cheapest card that allows you to pause live TV, and it works well. Pressing the time-shift button starts recording in the background, so you can pause, rewind or fast-forward through a programme.

It may be fiddly to set up but the WinFast TV 2000 XP does everything you would expect of an analogue TV card, and at under £30 it is great value.



Cheap; lots of features



Convolved installation and tuning procedure

SPECIFICATIONS PCI interface, RF, line in, S-video, composite, infrared and FM inputs

REVIEW ANALOGUE TV TUNER

PINNACLE
PCTV 100e

RATING ★★★★★

PRICE £48 inc VAT

SUPPLIER www.specialreserve.co.ukDETAILS www.pinnaclesys.com

The 100e is a neat USB tuner. Its RF input and USB port are sensibly tucked away on the back. The front has an audio line in, S-video and composite inputs. Unlike many TV tuners, however, you can't use it to listen to FM radio.

There is also an IR receiver for Pinnacle's big silver remote. The remote looks a bit tacky, but is excellently designed with well-spaced and clearly labelled buttons. One oddity is that the large Pinnacle logo button is used to launch the software rather than the usual power button.

The 100e uses Pinnacle's Media Center software. It's easy to install, but we had to find the channel scan function ourselves before searching for analogue channels. When tuned, it produced a picture with slight ghosting and jittering noise. However, playing a DVD via S-video produced a well-balanced image with well-reproduced flesh tones.

After setup the software performed well, reacting smoothly to the remote control. It runs in a window or using a full-screen interface. The full-screen interface allows you to navigate through other video files on your PC, and is compatible with most popular video, audio and image file formats. The 100e has the best time-shifting function of all the analogue TV tuners in this review.

This tuner has well-designed hardware and good software, and it is the best choice for watching analogue TV via USB.



Good software; well built



No FM radio; average picture quality

SPECIFICATIONS USB interface, RF, S-video and composite inputs



REVIEW ANALOGUE TV TUNER

PINNACLE
PCTV 110i

RATING ★★★★★

PRICE £46 inc VAT

SUPPLIER www.uk.insight.co.ukDETAILS www.pinnaclesys.com

Pinnacle's 110i PCI tuner uses the same software as its 100e USB TV tuner. Unlike the 100e, though, it has an FM aerial input and can show Teletext pages.

The Media Center software has some clever touches. It can link to Pinnacle's ShowCenter 200 media-streaming device, which was awarded five stars in *Shopper* September 2005. This allows ShowCenter users to stream live or recorded TV to any television in their home via a wired or wireless network. You can also control time-shifting from the ShowCenter. This system allows you to use a TV recording system in your study, which does all the noisy work, while you control it from the living room in peace.

When viewing TV in a window the picture looked fine, with no excessive noise or ghosting. When expanded to fit the full screen, though, it looked pixelated. Similar pixelation and jagged edges were evident in our DVD test.

The 110i is compatible with the TVTV programme guide at www.tvtv.co.uk. This costs £15 per year, and allows you to browse listings through your browser and set up recordings with a single click. You can also set up recordings remotely from another PC via the web or from your mobile phone using WAP.

The 110i has some clever functions, but its picture quality is disappointing when viewing in full-screen mode. The Pinnacle 100e and Leadtek WinFast TV 2000 XP produce a far better picture.

✓ Good software; FM radio

✗ Poor picture in full-screen mode

SPECIFICATIONS PCI interface, RF, line in, S-video, composite, infrared and FM inputs

REVIEW DIGITAL TV TUNER

AVERMEDIA
AVerTV DVB-T USB2

RATING ★★★★★

PRICE £53 inc VAT

SUPPLIER www.cclonline.comDETAILS www.averm.co.uk

This is the most attractive USB TV tuner in the group and its compact silver body is very sturdy. It has an aerial input and USB port on its rear side, but it has no video inputs for copying from a camcorder.

The front side holds an infrared sensor for the remote control. The remote is simple to use and not cluttered with unnecessary buttons. A mini TV aerial is supplied in the box, but it's no substitute for a proper roof-mounted aerial.

The TV software is easy to install and launches the channel-tuning utility automatically. It quickly located all the usual Freeview channels, but they weren't listed in the usual order. Watching TV, recording programmes and time-shifting are all simple. The interface is neat, particularly when watching TV in a window, where all the necessary controls are easy to find. There's also a handy bar that shows your progress through a show compared to the progress of the live broadcast when you're time-shifting.

The EPG is annoying, as you have to select an individual channel before you can scroll through a list of programmes. This makes it impossible to scan quickly through what's on every channel.

This dinky USB tuner is well built and simple to use. It's the best way to add Freeview to a notebook computer. However, if you have a PCI slot free, the TwinHan Ter D+A has a better EPG.

✓ Compact and attractive

✗ Poorly implemented EPG

SPECIFICATIONS USB interface, RF input

REVIEW DIGITAL TV TUNER

AVERMEDIA
DVB-T STB7

RATING ★★★★★

PRICE £94 inc VAT

SUPPLIER www.mediaatlantic.co.ukDETAILS www.averm.co.uk

AVerMedia's DVB-T STB7 lets you watch Freeview TV channels on your PC by connecting to your monitor's D-sub connection and acting like a set-top box.

Setting it up is incredibly easy. The unit has two VGA ports: one connects to your PC, the other to your monitor. You can choose to overlay the TV picture over part of your PC display, or use the whole screen as a TV. S-video and composite outputs allow you to connect to a TV or video recorder.

The DVB-T STB7 can enlarge a PAL TV signal to fill larger screens with a resolution of up to 1,280x1,024. The picture quality is satisfactory and on a par with that of the best digital TV tuners in this group, but not as impressive as that of expensive LCD TVs. It has full support for channels that broadcast in 16:9 widescreen mode.

The interface is neat and can display a one-week EPG for channels that support it, with 'now' and 'next' information for the others. Channels are listed in an unusual order, though, which can be annoying. As the DVB-T STB7 doesn't connect to your PC, there's no way to record programmes to disk.

The DVB-T STB7 isn't as versatile as a standard digital TV card, but it has advantages. It's easy to set up and is an excellent way to watch TV on an office projector. As long as you don't want to record or time-shift, it works well and is reasonably priced.

✓ Very easy to set up

✗ Can't record to your hard disk

SPECIFICATIONS VGA interface (D-sub), 640x480, 800x600, 1,024x768 and 1,280x1,024 output resolutions

REVIEW DIGITAL TV TUNER

HAUPPAUGE
WinTV-NOVA-T PCI

RATING ★★

PRICE £60 inc VAT

SUPPLIER www.dabs.comDETAILS www.hauppauge.co.uk

We last reviewed the NOVA-T in *What's New, Shopper* May 2005, where it received a respectable three stars. The competition has moved on, though, and this Hauppauge card is beginning to look dated.

The card is very simple and has only three sockets: one for the aerial, a pass-through so the same aerial can be connected to another device, and one for the infrared receiver. The remote control is silver with lots of spongy buttons, most of which are superfluous.

Setting up the software takes time. Four drivers are needed, as well as several separate Windows applications. Once this is sorted out, the software automatically launches a tuning application to locate the Freeview channels.

Hauppauge's WinTV 2000 software works well, but it's not that easy to use. The EPG shows only 'now' and 'next' programme information, a poor substitute for the one-week guide provided by some digital tuners. There is a recording scheduler, though, so you can set programmes to record manually by entering channel and time details. It's also compatible with the TVTV online programme guide, which costs £15 per year.

The NOVA-T is reasonably priced and includes everything you need to watch and record Freeview channels. Its EPG is limited, though, and it can't match the excellent and slightly cheaper TwinHan Ter D+A.

✓ Inexpensive

✗ Limited EPG; poor software

SPECIFICATIONS PCI interface, RF and infrared inputs



REVIEW DIGITAL TV TUNER

NEBULA ELECTRONICS DigiTV PCI

RATING ★★★★★

PRICE £101 inc VAT

SUPPLIER www.pcvideo.co.ukDETAILS www.nebula-electronics.com

Nebula's DigiTV PCI tuner arrived in a brown box with only a CD and instruction sheet. However, it was the best digital tuner in the group.

Setup is straightforward, as the drivers and software install quickly. When the application is run for the first time, it automatically finds all available channels. We could then sort them into the right order with a single click.

Nebula's software is outstanding. Changing channels is quick and smooth and pausing live TV is simple. The picture quality is as good as that of other digital tuners; we encountered only occasional compression artefacts.

The EPG works flawlessly, assembling the upcoming programmes into a format that's easy to understand. Its layout resembles the Sky+ system, and selecting programmes to record is as easy as selecting a channel to watch. By installing the software on another PC, you can stream TV programmes across your home network and watch them from there. There are some clever touches, such as the way that subtitles appear when you mute the volume.

The DigiTV PCI is almost twice the price of some digital tuners, but it oozes quality. People on a budget may prefer the cheaper TwinHan, but this is the most impressive TV tuner we've seen.



Great software with brilliant EPG



Expensive

SPECIFICATIONS PCI interface, RF, line in, S-video, composite, infrared and FM inputs

REVIEW DIGITAL TV TUNER

PINNACLE PCTV 200e

RATING ★★★★★

PRICE £79 inc VAT

SUPPLIER www.savastore.comDETAILS www.pinnaclesys.com

This neat design incorporates an aerial and TV tuner in one compact folding device. This makes it ideal for notebook users, and even better if you want to take your notebook and watch TV while away from home. The software allows you to make quick channel scans, so you can easily re-orientate the aerial and scan to find the best possible reception. An external antenna adaptor is also supplied so you can connect to a rooftop aerial when one is available.

This device uses the same Media Center software as Pinnacle's analogue tuners. The digital version includes an EPG, which displays programme information for the week ahead where available. Unfortunately, it can't show future programming for several channels simultaneously. The remote control feels sluggish when changing channels, but the one-touch time-shift function works with only the slightest pause.

The software bundle also includes Pinnacle's MediaManager software, which lets you organise your recorded TV shows as well as audio, video and image files. You can also set the software up to record directly to DVD, which is handy if you have little hard disk space.

The 200e's built-in aerial makes it ideal for use on the move. If you plan to connect your computer to a roof-mounted aerial, however, you'd be better off with the AVerTV DVB-T USB2.



Built in aerial; great software



Poor EPG

SPECIFICATIONS USB interface, RF input

REVIEW ANALOGUE/DIGITAL TV TUNER

AVERMEDIA AVerTV Hybrid+FM PCI

RATING ★★★★★

PRICE £75 inc VAT

SUPPLIER www.mediaatlantic.comDETAILS www.averm.co.uk

This tuner has the usual RF and FM inputs on the rear, and comes with a breakout lead that adds S-video in, composite in, phono and infrared inputs, so it's easy to find the connector you need when leaning behind your PC. The remote control is a joy to use, with a spacious layout and clear markings.

The installation process is well thought out. The drivers and software install quickly, and starting the software for the first time launches the tuning application automatically. Here you can locate analogue, digital and FM stations with ease. It doesn't find and save the channel names for the analogue TV stations, though, so you have to order and name them manually. It produced a sharp picture from both analogue and digital channels, though we noticed some artefacts when playing a DVD via S-video.

The software is identical to that provided with AVerMedia's USB tuner. Time-shifting is smooth, and it's easy to switch between analogue and digital channels without entering a settings menu, although we wonder how often this would be useful. AVerMedia's EPG is disappointing, though, as you can't view programme information for multiple channels simultaneously. It is also impossible to access the EPG while time-shifting or recording.

AVerMedia's hybrid card isn't bad, but its EPG is poor. TwinHan's Ter D+A is cheaper and includes better software.



Easy switching from digital to analogue; decent remote control



Expensive; poorly designed EPG

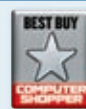
SPECIFICATIONS PCI interface, RF, phono line in, S-video, composite, infrared and FM inputs

REVIEW ANALOGUE/DIGITAL TV TUNER

TWINHAN Ter D+A

RATING ★★★★★

PRICE £55 inc VAT

SUPPLIER www.pcnextday.co.ukDETAILS www.twinhan.com

The TwinHan Ter D+A has FM, S-video and composite inputs as well as aerial and infrared receiver inputs, plus a remote control with lots of fiddly buttons.

Installing the card is simple enough. It uses CyberLink's PowerCinema 4 software, which is comprehensive. The setup wizard asks you to choose whether you want to use the analogue or digital tuner. The software found all five analogue channels in no time and stored their names automatically. Freeview channels were displayed perfectly, but we noticed some slight ghosting and pixelation on analogue broadcasts. Our DVD was displayed perfectly through the S-video input. The function for pausing live TV worked perfectly, without even a flicker.

You can switch to Freeview reception using the settings menu. It scanned for channels quickly, finding all the Freeview broadcasts and EPG information. CyberLink's PowerCinema software is a versatile application that can also control audio, video and image files and play DVDs.

TwinHan's Ter D+A is a real bargain. If you don't yet have Freeview TV in your area, it lets you watch the five channels currently available and switch seamlessly in the future. Even if you never use the analogue tuner, it's a great digital TV tuner. Unless you watch enough TV to justify buying the excellent but expensive Nebula DigiTV PCI, this is the Freeview tuner to get.



Analogue or digital TV; great software



Remote is slightly fiddly

SPECIFICATIONS PCI interface, RF, S-video, composite and infrared inputs



ANALOGUE TV TUNERS



MANUFACTURER	HAUPPAUGE	HAUPPAUGE	LEADTEK	PINNACLE	PINNACLE
Model	WinTV-Express	WinTV-USB2	WinFast TV 2000 XP	PCTV 100e	PCTV 110i
Rating	★★	★	★★★★★	★★★★	★★★
PHYSICAL					
Type	Analogue	Analogue	Analogue	Analogue	Analogue
Interface	PCI	USB	PCI	USB	PCI
Input connectors	RF, line in, composite	RF, S-video, composite, line in	RF, IR, S-video, composite, line in, FM	RF, composite, S-video	RF, FM, IR, composite, S-video
Output connectors	Line out	Line out	Line out	Line out	None
Remote control	No	Yes	Yes	Yes	Yes
EXTRAS					
Electronic programme guide	No	No	No	No	No
Teletext	Analogue	Analogue	Analogue	No	Analogue
Radio	No	No	FM	No	FM
Recording codecs	MPEG1, DivX	MPEG1, DivX	MPEG1, MPEG2, MPEG4	MPEG1, MPEG2	MPEG1, MPEG2
Hardware MPEG2 encoding	No	No	Yes	Yes	Yes
Software	Hauppauge WinTV 2000	Hauppauge WinTV 2000	Winfast PVR, Ulead VideoStudio 8 SE, Ulead Cool 3D SE, Ulead DVD MovieFactory 3 SE	Pinnacle Media Center, Pinnacle Studio 9 Quick Start	Pinnacle Media Center, Pinnacle Studio 9 Quick Start
Windows compatibility	Windows 98 SE/Me/2000/XP	Windows XP	Windows 98 SE/Me/2000/XP	Windows XP	Windows XP
Minimum specification	750MHz processor (1.5GHz processor for DivX)	733MHz processor	1GHz processor, 128MB RAM	2GHz processor, 256MB RAM	1.8GHz processor, 256MB RAM
BUYING INFORMATION					
Price inc VAT	£24	£53	£29	£48	£46
Supplier	www.savastore.com	www.dabs.com	www.savastore.com	www.specialreserve.co.uk	www.ukinsight.com
Phone	08716 661616	N/A	08716 661616	08707 259999	0800 333333
Details	www.hauppauge.co.uk	www.hauppauge.co.uk	www.leadtek.co.uk	www.pinnaclesys.com	www.pinnaclesys.com

DIGITAL TV TUNERS



ANALOGUE/DIGITAL TV TUNERS

MANUFACTURER	AVERMEDIA	AVERMEDIA	HAUPAUGE	NEBULA ELECTRONICS	PINNACLE	AVERMEDIA	TWINHAN
Model	AVerMedia DVB-T STB7	AVerTV DVB-T USB2	WinTV-NOVA-T PCI	DigiTV PCI	PCTV 200e	AVerTV Hybrid+FM PCI	TerD+A
Rating	★★★★	★★★★	★★	★★★★	★★★	★★★	★★★★★
PHYSICAL							
Type	Digital	Digital	Digital	Digital	Digital	Analogue/digital	Analogue/digital
Interface	D-sub	USB	PCI	PCI	USB	PCI	PCI
Input connectors	RF, VGA, line in	RF	RF, IR	RF, composite, IR	RF	RF, IR, FM, composite, S-video, dual phono line in	RF, IR, composite, S-video
Output connectors	VGA, S-video, composite, phono, RF, line out	None	RF	RF	None	None	None
Remote control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EXTRAS							
Electronic programme guide	One week	One week	Now and next	One week	One week	One week	One week
Teletext	No	No	No	DVB	DVB	Analogue	DVB
Radio	DVB	DVB	DVB	DVB	DVB	DVB, FM	DVB, FM
Recording codecs	N/A	MPEG2	MPEG2	MPEG2	MPEG2	MPEG2	MPEG2
Hardware MPEG2 encoding	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Software	N/A	AVerTV	Hauppauge WinTV 2000	DigiTV	Pinnacle Media Center, Pinnacle Studio 9 Quick Start	AVerTV	CyberLink PowerCinema 4
Windows compatibility	N/A	Windows 2000/XP	Windows XP	Windows 2000/XP	Windows XP	Windows 2000/XP/MCE	Windows XP
Minimum specification	N/A	1GHz processor, 128MB RAM	800MHz processor, 128MB RAM	1GHz processor, 64MB RAM	1GHz processor, 256MB RAM	2.4GHz processor, 128MB RAM (1.7GHz processor, 256MB RAM for digital)	600MHz processor, 128MB RAM
BUYING INFORMATION							
Price inc VAT	£94	£53	£60	£101	£79	£75	£55
Supplier	www.mediaatlantic.com	www.cclonline.com	www.dabs.com	www.pcvideo.co.uk	www.savastore.com	www.mediaatlantic.com	www.pcnexday.co.uk
Phone	N/A	N/A	N/A	N/A	08716 661616	N/A	N/A
Details	www.averm.co.uk	www.averm.co.uk	www.hauppauge.co.uk	www.nebula-electronics.com	www.pinnaclesys.com	www.averm.co.uk	www.twinhan.com

HOW WE TESTED

We tested all the TV tuners using a roof-mounted permanent aerial. If you have a good TV or tuner, this is capable of displaying a perfect picture of Freeview channels. Its analogue signal isn't so great, providing a good test of a card's abilities with borderline reception. The best should be capable of producing a stable picture without excessive ghosting.

We installed each tuner on a mid-range desktop PC system with a 2.4GHz Pentium 4 processor and 512MB of RAM. We checked the results using a high-quality 19" LCD monitor with a response time of 16ms.

Each TV card was installed and configured in the manner recommended by its manual or quick-start guide. Once the channels were tuned, we checked the image quality. Where applicable, we tested S-video and composite video inputs using a signal from our high-quality DVD player.

LABS VERDICT TV TUNERS

If you can't receive or don't want Freeview, we recommend Leadtek's WinFast TV 2000 XP. This costs just £29 and comes with a decent bundle of software. Despite what its name suggests, it's also compatible with most older versions of Windows. It wins our Best Budget Buy award.

If you want a Media Center-style interface, the TwinHan Ter D+A hybrid card is only a bit more expensive. Notebook users who require a USB device should pick the Pinnacle 100e. This is the cheapest USB analogue tuner and works well.

If you want to watch Freeview channels on a desktop PC, there are some outstanding products

to choose from. Nebula Electronics' DigiTV PCI is the most impressive digital TV tuner we've seen, with an excellent EPG that will satisfy TV addicts. Unfortunately, it costs over £100.

Unless watching TV is your main hobby, we'd recommend you save £45 and pick the TwinHan Ter D+A instead. It receives analogue and Freeview channels, and comes with CyberLink's excellent PowerCinema 4 software. It is deserving of our Best Buy award. Notebook owners with a rooftop aerial should choose the AVerMedia AVerTV DVB-T USB2. Those who don't have a fixed aerial should go for Pinnacle's PCTV 200e. **CS**

ANALOGUE TV TUNER

LEADTEK
WinFast TV
2000 XP



DIGITAL TV TUNER

NEBULA ELECTRONICS
DigiTV PCI



ANALOGUE/DIGITAL TV TUNER

TWINHAN
Ter D+A

